ABSTRACT

Population studies often estimate mammography use using women's self-reports. In one North Carolina county, we compared self-report surveys with a second method—counting mammograms per population—for 1987 and 1989. Estimates from self-reports (35% in 1987, 55% in 1989) were considerably higher than those from mammogram counts (20% in 1987, 36% in 1989). We then confirmed 66% of self-reports in the past year. Self-reported use is more accurate regarding whether a woman has had a mammogram than when she had it, but self-reports accurately measure change over time. (*Am J Public Health.* 1992;82:1386–1388)

Measuring the Use of Mammography: Two Methods Compared

Darrah Degnan, BSc, Russell Harris, MD, MPH, Jane Ranney, PhD, Dana Quade, PhD, Jo Anne Earp, ScD, and Jorge Gonzalez, MD

Introduction

A number of studies have examined the percentage of women in the population receiving mammograms.[1–4] Most of these studies rely on self-reported behavior, subject to the errors of this method.[5–7]

We collected self-report data on mammography use by a random-digit dialing telephone survey in a single county of North Carolina.[2] Using institutional records, we also documented mammograms performed on county residents for 1987 and 1989. This paper compares these two methods of measuring mammography use.

Methods

This study was approved by the Committee on the Protection of Human Subjects of the University of North Carolina School of Medicine.

Site and Population Characteristics

The total population of New Hanover County, NC, is 120 000, with about 14 000 women aged 50 to 74 years.[8] Because New Hanover contains a regional medical center and is geographically isolated, nearly all county residents use local sources of medical care.

Data Sources

Telephone survey self-reports. In January 1988 and 1990, we conducted 15-minute random-digit dialing telephone interviews with county women aged 50 to 74 years. Women were asked, "Have you ever had a mammogram?" and "How long ago did you have your last mammogram?" The telephone response rates were 73% (n = 487) in 1988 and 74% (n = 486) in 1990. Respondents were invited to give their names for follow-up; 85% did so.

Mammogram counts from institutional records. From all radiology centers, we obtained logbook or computer report listings of all county women who had had mammograms in 1987 and 1989, and we collected a copy of the mammogram reports. Data (name, age, social security number, zip code, date of mammogram) from all centers were combined into a single database. Women not aged 50 to 74 years and out-of-county residents were excluded. We then divided the number of county women who had had a mammogram by the number of all county women aged 50 to 74, using population estimates from the North Carolina Office of State Management and Budget.

Validating January 1990 Self-Reports against Institutional Records

We supplemented the 1987/1989 mammogram listings with listings from 1988 and January 1990. We matched "self-report" women by date of birth and name with their most recent mammogram in the expanded database. We confirmed matches by comparing the self-reported telephone numbers with those on the mammogram reports. To verify the identity of women not matched, we used telephone numbers from public directories. We also searched institutional databases for women not matched, both those reporting and those denying a past-year mammogram. We did not attempt to verify reports of women who claimed mammography outside the county (n = 19).

Analysis

We calculated the proportion of women who reported having had a mammogram for 1987 and 1989. We used linear regression to estimate the relationship between reported months and actual months

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TABLE 1—Verification of Mammogram Self-Reports of Woman Aged 50 to 74 Years in New Hanover County, North Carolina, 1989

Self-Reported Date of Most Recent Mammogram	Actual Date of Mammogram Confirmed by Mammogram Report: Within Past Year	More Than 1 Year Ago; Not More Than 2 Years Ago	More Than 2 Years Ago	No Report Found	Total
Within past year	164	58	8	17[a]	247
More than 1 year ago but not more than 2 years ago	1	22	11	5	39
More than 2 years ago	0	0	5	12	17
None	1	0	0	152	153
Total	166	80	24	186	456

[a]Includes two who had chest X-rays and eight whose identity could not be independently verified.

since the last mammogram. We used the χ^2 statistic to relate the accuracy of the self-report to age, education, employment, and income groups.

Results

In January 1988, 35% of interviewed women reported having had a mammogram in the past year; this increased to 55% in 1990.[9] The mammogram counts from institutional records were 2650 (20% of the population of 13 501) for 1987 and 4994 (36% of population of 14 025) for 1989.[9] After excluding 19 women who reported a past-year mammogram but outside the county, we matched mammogram records in 1989 for 164 of the remaining 247 women (66%) interviewed in January 1990 who reported a past-year mammogram in the county (Table 1). The 164 confirmed self-reports totaled 34% of the initial survey sample (n = 486), compared with 36% of the same population found by counting mammograms (Figure 1).

Incorrect recollection of the date—actually longer than past-year—was more common (66/247 or 27%) than unconfirmed reports (17/247 or 7%). The regression line equation for plotting reported time since last mammogram against actual time was actual time = 2.54 + (1.02 × reported time), indicating that actual time was about 3 months longer on average than reported time. Among those denying a mammogram, one report was found. There was no statistically significant association between accuracy of self-report and age, education, employment, or income.

Discussion

Women aged 50 to 74 in one county reported higher mammography usage within the previous year than that calculated from institutional records (35% vs 20% in 1987; 55% vs 36% in 1989). Change over time was similar by both methods (20% vs 16%). Of those interviewed in 1990 who reported having had a mammogram within the county in the past year, 66% were confirmed by mammogram records. We found the overreporting by self-report was due primarily to underestimating the time since the last mammogram ("telescoping"), not to unconfirmed usage.

Although telephone interviews do not gather information about women without telephones (12% of all households) or about nonrespondents, the response rate of our survey was acceptable for a population survey,[5] and the percentage of women with validated self-reports (34%) agreed closely with usage calculated from institutional records (36%).

To our knowledge, no previous study has examined mammogram counts per population as a method of measuring mammography use. Although the mammogram count method avoids the overreporting found in the self-report method, it introduces a potential undercount if all mammograms are not located. We are confident that we located nearly all mammograms because (1) the setting made it likely that nearly all county residents would have had mammography within the county, and (2) we were able to document a mammogram of some date on all but 7% of the respondents.

Our results agree with those of Gordon et al. (personal communication, October 23, 1991), who confirmed 67% of

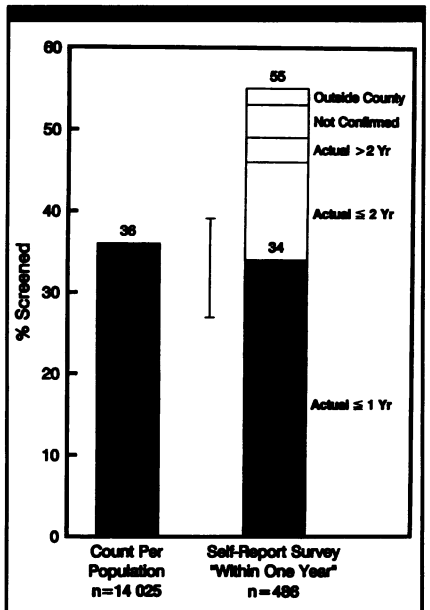

FIGURE 1—Percentage of women aged 50 to 74 screened in past year, New Hanover County, North Carolina, 1989.

reported mammograms within the previous year for women aged 50 to 74 years in a large health maintenance organization. They differ, however, from those of King et al.,[10] who verified 94% in another health maintenance organization where respondents were concurrently cued to get mammography. We agree with others[7,11,12] that the telescoping phenomenon should be taken into account in survey research.

Measuring mammography rates in a general population by self-report is accurate for determining whether a woman has had a mammogram but is less accurate for determining when. Surveys that ask "when was your last mammogram" will overestimate usage. Such surveys can, however, accurately estimate change in usage. In suitable areas, researchers can estimate usage directly by counting institutional records. □

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Women with Multiple Sexual Partners: United States, 1988

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ABSTRACT

Women who have multiple sexual partners in a short time period are appropriate targets for sexually transmitted disease (STD) prevention. We analyzed survey data collected in 1988 from a nationally representative sample of 8450 American women aged 15 to 44 to identify markers of such behavior. Among sexually active persons, 0.4% of married women and 8.4% of unmarried women had two or more sexual partners in the 3 months preceding the interview; unmarried marital status, early age at first sexual intercourse, lack of religious affiliation, and young age were associated with this behavior. All except young age were predictive after multivariate analysis. Such factors may help define women at elevated STD risk and allow better targeting of STD prevention. (*Am J Public Health.* 1992;82:1388–1394)

Introduction

Each additional sexual partner puts an individual at some incremental risk of exposure to a sexually transmitted pathogen and increases the dissemination of such pathogens. The number of lifetime sex partners quantifies an individual's cumulative risk for persistent viral sexually transmitted diseases (STDs) and cervical cancer[1–5] and is associated with bacterial STDs, including pelvic inflammatory disease.[6–8] The number of sex partners in a recent time interval, such as the previous several months, is a more precise measure for assessing the risk for incident infection: among STD clinic patients, having multiple partners in a specific recent time period (less than 6 months) is a risk factor for the acquisition of bacterial STDs, such as gonorrhea,[9,10] chlamydia,[11–13] syphilis,[14] and chancroid,[15] as well as for the presence of viral STDs.[16–18] Furthermore, for STDs with a short period of infectiousness, such as gonorrhea, having multiple partners in a short time span increases the rate of dissemination in the population.

One way to identify individuals at greatest risk is to focus on those who report having two or more partners in a specific time interval. Having multiple recent partners is associated with disease risk for at least two reasons: first, it reflects the increased likelihood of encountering a sexually transmitted pathogen through having multiple potential exposures, and second, it may reflect an increased probability of choosing a partner with an infection through a riskier pattern of partner recruitment.[19,20] Primary prevention strategies to reduce the number of sexually transmitted infections can use the characteristics of these women to target education and counseling that encourage safe sexual practices. Secondary prevention strategies, aimed at early diagnosis and treatment of asymptomatic infection, can target these high-risk women for selective screening (e.g., for human immunodeficiency virus, syphilis, and/or pelvic inflammatory disease).

Over this century, Americans have increasingly had greater numbers of sexual relationships, in part because of postponed marriage, increases in separation and divorce, and more reliable contraception.[21,22] A growing majority of unmarried

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